Essay #3:

To what extent is originality required to perform your work assignments? Describe the availability of existing practice and guidance in your area of work, and where your work has resulted in modifications to guidelines/guidance or the creation of new guidelines/guidance. GS-14 candidates should provide examples of how they used good judgement, versatility, ingenuity, and innovation to apply their expertise in situations where guidelines or methods were not clear, or did not exist. GS-15 candidates should demonstrate similar unique contributions and how they ensured the success of an Agency program including situations involving uncertainty and/or time constraints, unusual demands, extraordinary emergencies, significant public interest, or situations involving significant economic restraints or impact.

Scientific evaluation generally requires originality, expert judgement, and innovation to address scientific issues. These aspects of scientific evaluation are apparent in my previous and current work experience (see CV). My risk assessment, environmental epidemiology, and systematic review expertise (see essay #1) was instrumental in informing and advancing environmental and public health decisions where guidelines were incomplete or lacking. In addition, Risk Assessment Forum (RAF) work has also been a venue for using judgment and innovation to advance risk assessment. The following are examples of how I applied good judgement, ingenuity and innovation when information or guidelines were lacking.

Risk Assessment:

- Developed exposure evaluations that required judgements about unique exposure circumstances at a wide variety of contaminated site investigations (including Brownfields) for use by site managers (RPMs and OSCs) and risk managers by gathering and using site-specific and activity-specific information
- Provided scientifically and statistically defensible estimates of acceptable contaminant levels where specific standards were not available by using innovative statistical approaches
- Advanced the field of risk assessment by contributing to the innovative development of national guidance for Probabilistic Risk Assessment (see attached) and proposed national guidance for Background samples for use by regional Risk Assessors
- Participated in the resolution of scientific issues related to the choice of critical study, hazard identification, data modeling and uncertainty factors for at least 40 PPRTVs (see Appendix A and B of CV) by using expertise and scientific judgement
- Redirected suspended IRIS assessments (see essay #1) to journal articles in order to disseminate current chemical-specific information by using judgement, ingenuity, and innovation. For context, due to their complexity and extensive review, the level of effort to complete one draft (or finalized) IRIS Toxicological Review is approximately equivalent to 3-5 peer-reviewed manuscripts.

Epidemiology Support:

- Developed and tested various outcome-specific study evaluation protocols with assistance from outside experts where guidelines for establishing such criteria did not exist by identifying and addressing issues using current outcome-specific scientific research and expertise

- Developed study quality criteria for evaluating epidemiology studies by using expert judgement, expert consultation and through workgroup discussions with peers to apply current outcome-specific advances and to resolve issues
- Used good judgement and innovation in applying epidemiology expertise to support a quick turnaround for TSCA regulatory requirements by suggesting changes to criteria and data extraction forms used in evaluation of epidemiology studies

Systematic Review:

- Enhanced systematic review SOPs for use by IRIS, TSCA, states and CPHEA by modifying critical elements for testing PECOs, screening strategies, literature inventories and study evaluations through written instructions, presentations and workflows
- Applied systematic review methods to the IRIS chloroform assessment, suspended assessments of ammonia (oral) and uranium, and systematic evidence maps for phthalates, acrolein, and naphthalene by tailoring an innovative approach (evidence mapping) for rapid systematic review of assessments
- Developed and improved the practical application of the systematic review process by identifying critical flaws in systematic review components and modifying them
- Assisted in developing and applying iterative detailed strategies for study evaluation and data extraction which resulted in improved evaluations
- Organized pilots for testing PECOs, screening strategies, literature inventories and study evaluations and modified elements as needed for better efficiency
- Provided systematic review support for TSCA to help them meet regulatory requirements associated with TSCA chemical risk evaluation, a high priority for the Agency requiring a rapid turnaround by using creativity and innovation to meet tight deadlines (as noted previously I received an Award for this)

Risk Assessment Forum (RAF):

- As a member of the RAF I chaired the Subcommittee on Research Planning for Cumulative Risk Assessment (CRA) and was responsible for identifying needs, issues and priorities of the Regions and Program offices as they relate to CRA and for providing direction, priorities and perspective to Research Planning where none existed before
- As a member of the CRA writing team, I assisted in the development of the current draft CRA Guidance titled '*Guidance for Cumulative Risk Assessment; Planning and Problem Formulation, (revised Risk Assessment Forum Review Draft, 2019)*'. This describes steps for the planning and problem formulation of cumulative risk assessments (CRA) and offers guidance for when such assessments might be appropriate. It updates and supersedes the *1997* [HYPERLINK "http://www.epa.gov/sites/production/files/2015-01/documents/cumrisk2_0.pdf" \h]. This guidance places emphasis on providing a uniform yet flexible cumulative risk assessment (CRA) planning and problem formulation methodology to be used as a decision support tool for risk management at the Agency, thus advancing risk assessment.
- Authored, with other Agency scientists, the *Guidance for Applying Quantitative Data to Develop Data-Derived Extrapolation Factors for Inter-Species and Intra-Species Extrapolation* ([HYPERLINK "https://www.epa.gov/sites/production/files/2015-01/documents/ddef-final.pdf"]) where none existed (see attached). This guidance describes

an innovative approach for identifying and using pertinent information for developing data-derived extrapolation factors (DDEFs) for the purposes of developing Reference Doses (RfDs), Reference Concentrations (RfCs), or related metrics (such as hazard index, margin of exposure) in lieu of using default values and processes thereby reducing uncertainty in RfD and RfC values, thus advancing risk assessment.